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# Green web hosting 2.0 - New energy-efficient-direct-current-powering technology to supply datacenter servers?

In March 2008 California-based science research center Lawrence Berkeley National Laboratory released their final report describing recent work, tests and demonstrations done concerning DC Power for Data Center Efficiency.

Based on industry indications that the powering of many existing data centers is done so in an inefficient and power-wasting manner, the "Demonstration" project's objectives were to demonstrate the reliability and energy-efficiency of an alternative power delivery system using direct-current server rack powering in comparison to standard AC power distribution.

From the results following conclusions could be drawn:

- **Efficiency** - By eliminating conventional conversion steps, normally a common source for power loss, tested DC-power solutions showed a minimum 5% to 7% efficiency gain. These gains did not include power reductions in cooling loads.
- **Availability** - The project showed the availability of DC-powered servers, how they can be easily applied and adapted to data centers currently using standard AC powering solutions.
- **Functionality** - DC-powered servers showed no indication of constrains in performance when compared to AC powered servers.

In final conclusion the report listed identified areas for follow up investigations. This to help establish industry discussions and engagement concerning the future of DC powering. One included area was the Integration of Other Sources, such as renewable energy sources.

Renewable energy sources to supply web hosting data centers? Is DC powering to be considered the future of green web hosting?

William Tschudi, project contact at LBNL states in an email correspondence; "We'll have to see. There is growing interest in the concept and some early adopters are moving ahead. There are some DC centers in Europe and Japan and through our collaboration we now have an opportunity to create a world wide standard for voltage and connectors which would enable the same type of equipment to be delivered anywhere in the world."

Tschudi continues "The reason that the industry is beginning to look at the use of DC directly is that some of the power that is normally lost in the conversion process can be saved resulting in substantial energy savings since these facilities operate continuously."

"The power lost in the conversion process also generates heat which must be removed through the HVAC system. So saving this power has a multiplier effect in the building. There are also non-energy benefits in directly using DC. First of all there is less equipment in the chain so in the long run the capital cost will be less and there will be fewer points of failure so the system will be more reliable. The phone companies have always operated with DC power and their reliability is unmatched."

"In addition, power quality issues should be eliminated, again improving reliability. Finally, the use of DC will also enable seamless ties to renewable energy sources such as wind, solar, or fuel cells which generate in DC."

"In addition to the electronics (e.g. servers), we can also eliminate conversion loss in variable speed drives used for fans, pumps, and chillers and we can use DC lighting. Everything would operate more efficiently."

When asked how many web hosting providers that today are using DC powering William Tschadi replies; "Only a handful to my knowledge."

In conclusion it seems this type of DC powering still has some steps to take before being presented and accepted as a realistic alternative on the commercial market. Regardless, based on the results of the demonstration project, DC powering has the potential of becoming not only the new way of green web hosting but also a cost efficient solution for an industry heavily dependent on its power supply.



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